CLAIMS

1. A wavelength locker system, comprising,

   An optical tap placed in the optical path of a laser transmitter for splitting a laser signal into a tapped signal and laser output signal,

   A free space tunable filter accepting the tapped signal and producing two signals that add to form a representation of the tapped signal,

   Photodetector means coupled to the tunable filter for capturing both signals output from said tunable filter and producing two electrical signals that represent the power intensity of each of said two signals output from the tunable filter, and

   A means for accepting the two electrical signals output form the photodetector means and generating a feedback signal in response thereto,

2. The wavelength locker system of claim 1, wherein the photodetector means are integrated onto the tunable filter.

3. The wavelength locker system of claim 1, wherein the tunable filter is a liquid crystal tunable filter.

4. The wavelength locker of claim 3, wherein tunable filter is a bandpass filter and where the two signals produced thereby include a reflected signal and a transmitted signal.

5. The wavelength locker of claim 3, wherein the liquid crystal tunable filter is a tunable etalon.

6. The wavelength locker of claim 1, wherein the means for accepting the two electrical signals output from the photodetector means and generating a feedback signal in response thereto is a microcontroller.

7. The wavelength locker of claim 6, wherein the microcontroller also monitors the thermal environment of the tunable filter.

8. The wavelength locker of claim 7, wherein the microcontroller controls tuning of the tunable filter.

9. The wavelength locker of claim 1, wherein the tunable filter is tuned to an offset of a target lasing frequency at a 50% power transmission point.

10. A wavelength locker system, comprising,

An optical tap placed in the optical path of a laser transmitter for splitting a laser signal into a tapped signal and laser output signal,

A tunable filter accepting the tapped signal and producing two electrical signals that add to form a representation of the tapped signal, said filter tuned at an offset from a target lasing frequency at a point in which the two electrical signals output from the tunable filter intersect to form a lock point.

A means for generating a feedback signal in response to the two electrical signals output from the liquid crystal.

11. The wavelength locker of claim 10, wherein the feedback signal is coupled to the laser to form a feedback loop.

12. The wavelength locker of claim 10, wherein the feedback signal describes the direction and magnitude difference between the lock point and laser output signal.

13. The wavelength locker of claim 10, wherein the tunable filter is a liquid crystal device.

14. The wavelength locker of claim 13, wherein the liquid crystal device includes an integrated temperature sensor.

15. The wavelength locker of claim 13, wherein the liquid crystal device includes a metal seal.

16. The wavelength locker of claim 13, wherein the liquid crystal device includes an epoxy seal.

17. The wavelength locker of claim 15, wherein the metal gasket surrounds an aperture of the liquid crystal device.

18. The wavelength locker of claim 10, wherein the liquid crystal device includes a control system for maintaining the device operation in various temperatures.

19. A method of wavelength locking, including the steps of

   a. Providing a tunable filter that produces reflected and complimentary transmitted signal outputs,
   b. Reading the temperature of the tunable filter,
   c. Adjusting the tunable filter,
   d. Reading the outputs of the tunable filter,

e. Generating a wavelength locker feedback signal in response to the information collected in step D.

20. The method of claim 19, wherein step e includes a division operation.